UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/655,755	09/06/2000	Anders Eriksson	032559-071	9042

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EXAMINER
CHANG, EDITH M

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE **3** MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2006*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   In view of the appeal brief filed on May 26, 2006, PROSECUTION IS HEREBY

REOPENED. A new ground rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the

following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply

under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed

by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and

appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth

in 37 CFR 41.20 have been increased since they were previously paid, then appellant

must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by

signing below:

Mohammed H. Ghayour.

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER

Claim Objections

2.   Claims 1-22 are objected to because of the following informalities:

Claim 1 & 7, lines 7-8: "said discrete-time representation" should be "said

corresponding discrete-time representation".

Claim 10, line 3: "discrete-time representation" should be "corresponding discrete-time representation".

Claim 13, lines 8-9 & lines 10-11: "said discrete-time re representation" should be "said corresponding discrete-time representation".

Claim 17, lines 8-9, lines 10-11 & line 14: "said discrete-time re representation" should be "said corresponding discrete-time representation".

Claim 20, line 2: " the discrete-time" should be "the corresponding discrete-time".

Clams 2-6, 8-9, 11-12, 14-16, 18-19, and 21-22 are dependent on objected clams 1, 7, 13 and 17 respectively.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1, 2, 7, 8, 10-14, 17, 18 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 5,606,575) in view of Brennan et al. (US 6,236,731 B1).

Regarding **claims 1, 7, 13 & 17**, Williams discloses a digital filter design or convolution apparatus (the filter banks in Fig.5 implemented in Fig.3 Channelizer 111 &

Combiner 131, column 4, lines 38-40) and its method shown in Fig.6 and Fig.10

(column 4, lines 42-45 & lines 53-56), including

First, determining a real-valued discrete-frequency representation ($\underline{X}_k$(m) via FFT

460 of Fig.6) of a desired full length digital filter (X_k(m), the output of 471 of Fig.6).

Second, transforming said real-valued discrete-frequency representation into a

corresponding discrete-time representation (via Inverse FFT 630 of Fig.10);

Third, periodically extended said corresponding discrete-time representation

($\underline{X}_m$(r), output of Inverse FFT 630); and

Fourth, applying a shortening window (column 8, lines 28-31 wherein filter length

N is integer multiple of K, & column 8, lines 18-20 wherein sample M<K, hence M

samples in 631 is shorten than N-sample Accumulator 631 of Fig.10) to said

corresponding discrete-time representation (via Zero Valued Samples in N-Sample

Accumulator Shift Register 631 of Fig.10) to produce a zero-padded reduced length

filter (as shown in 632 Fig.10, Zero valued samples in N-sample Accumulator).

However, Williams does not explicitly specify circularly shifting said

corresponding discrete-time representation. Brennan et al. teaches the samples have

been periodically extended (86 of Figure 4 '731) from the circularly shift (84 Figure 4,

column 8, lines 58-65, '731). As Williams periodically extends said corresponding

discrete-time representation ($\underline{X}_m$(r) of Fig.10 '575), at the time of invention was made, it

would have been obvious to one of ordinary skill in the art to circularly shifting said

corresponding discrete-time representation taught by Brennan et al. in Williams' register

to save hardware and computation cost.

Regarding **claims 2, 8, 14 & 18**, inherit the limitation of claims 1, 7, 13 and 17 respectively. Brennan et al. teaches the well-known circular shift removing leading/tailing zeros (Figure 4 '731) of the zero valued samples in N-Sample Accumulator Shift Register (632 of Fig.10 575).

Regarding **claims 10 & 20,** inherit the limitation of claims 1 and 17 respecively, Williams discloses performing a convolution in the time domain using the corresponding discrete-time representation in Fig.5A (column 8, lines 25-40 '575).

Regarding **claims 11, 12 & 21, 22,** inherit limitations of claim 7 and claim 17 respectively, further Williams discloses using an overlap-add method in the frequency domain in Fig.4 and Fig.6 (column 4, lines 34-37 & lines 42-45).

5.   Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 5,606,575) in view of Brennan et al. (US 6,236,731 B1) as applied to claim 1 above, and further in view of Freed (US 5,686,683).

Regarding **claim 3**, inherits limitation of claim 1, further Freed teaches the noise suppressing spectral subtraction algorithm forming the discrete Fourier transform representation (output of block 40 FIG.1, output of 79 FIG.3 wherein the noise/broadband synthesis is detailed in FIG.5 '683). As Williams use the discrete Fourier transform representation, at the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have the noise suppressing spectral subtraction algorithm taught by Freed to form the Williams' discrete Fourier transform representation to suppress noise to get accurate signal.

Regarding **claim 4**, inherits limitation of claim 1, further Freed teaches the frequency selective non-linear algorithm for a realistic sound (human voice with echo cancellation, column 1 lines 17-24 & lines 45-49 '683) wherein the frequencies are selected for the discrete frequency algorithm.

6.   Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 5,606,575) in view of Brennan et al. (US 6,236,731 B1) as applied to claim 1 and claim 13 above respectively, and further in view of Leitch (US 5,202,900).

Regarding **claims 5 & 15**, Williams does not specify the shortening window being a Kaiser Window, however in FIG.2B Leitch teaches the Kaiser window (column 3, lines 38-50). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Kaiser window taught by Leitch as the shortening window to avoid the excess splatter in the signal (column 3 lines 44-46 '900) in order to have a more actuated filtered/windowed signal.

7.   Claims 6, 9, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 5,606,575) in view of Brennan et al. (US 6,236,731 B1) as applied to claims 1, 7, 13 and 17 above respectively, and further in view of Craven (US 5,548,286).

Regarding **claims 6, 9, 16 & 19**, Williams does not specify the minimum phase filter, however Craven teaches the minimum phase filter removing the leading zeros in an analogue and digital convolutions in FIG.1. In F1G.2 (C) the detail of block 30

comprise a minimum phase filter 34 (column 7 lines 21-28, '286), one arrangement of

the filter 34 is shown in FIG. 13 (column 5 lines 9-10, '286) wherein the leading zeros in

the filter response is cancelled by the filter (column 17 lines 25-30, '286). At the time of

the invention, it would have been obvious to a person of ordinary skill in the art to

implement the William's A-D Converter with Craven's teaching to have a more accurate

convolution (column 3 lines 45-46, 54-60 '286).

The modified/combined system further shifts the reduced length filter to remove

the leading zeros and transforms the reduced length filter further to a minimum phase

filter of an output (131 FIG.1, '575).

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Boland (US 4,636,972) describe method and apparatus for digital filtering in

FIG.1 and FIG.3 with frequency and corresponding time representation, circularly

shifting and applying shorten window.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Edith M. Chang whose telephone number is 571-272-

3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mohammed H. Ghayour can be reached on 571-272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Edith Chang
August 10, 2006

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER